

Life As Technology:  
The Rise of Informational Biology and Genetics in Literature from 1950-2006

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## Introduction

In the last twenty years, Dolly the sheep, the first mammal cloned from an adult somatic cell, has been used to symbolize the technological developments that led to her creation and the implications of her birth. Jose Van Dijck credits Dolly's birth with the frequent and repeated use of cloning in fiction to illustrate the dangers of human cloning. He writes that "In the public 'aftermath' of Dolly, a number of science fiction novels have been invoked [by the media] to illustrate extrapolations, evaluations and interpretations of the meaning of human cloning, particularly how cloning will affect our understanding of human identity and uniqueness" (Van Dijck). Van Dijck's work on the presence of fictional cloning in real-world ethical debates gestures towards the relationship between fictional cloning and real-world cloning.

Fiction that features human cloning has another set of applications outside of ethical debates. David Beer identifies two intersections with fiction and social theory. The first of these intersections, fictionalizing the theoretical imagination, suggests that fiction "becomes something to think with, a space for reflection and inspiration for escaping the conventions of academic disciplines and limits of established modes of thought" (Beer). The second intersection assumes that "fiction is used as a documentary resource that tells us something about specific times and places; it tells us about its broader social conditions as well as about the production processes and technological changes that shaped its form" (Beer). According to these theories, literature that focuses on human reproduction is both a record of and a meditation on the social conditions surrounding human reproduction at the time of publication.

Human cloning in fiction has a unique relationship with real-world cloning technology in that fictional clones predate much of our current understanding of genetics and biological relationships. This is reflected in the language used to talk about clones. Aldous Huxley in *Brave New World* (1932) discusses clones in terms of identical twins. In fact, the word “clone” was not necessarily used to designate genetically identical individuals until the 1960s and 1970s (Camenzind 24). Representations of cloning in fiction demonstrate the evolving conceptualization of the biological human that accompanied new technological developments.

This project grew from my interest in evolving concepts of the natural, the human, and the unique relationship between cloning as fiction and cloning as scientific fact. One reason for the persistence of human cloning in fiction is the simultaneous real-world development of cloning technologies and gene mapping that has taken place from the mid-twentieth century to the early twenty-first century. These technological developments in biology directly impact concepts of individuality and identity. My project analyzes William March’s *The Bad Seed* (1954), Octavia Butler’s *Dawn* (1987) and Kazuo Ishiguro’s *Never Let Me Go* (2005) in relation to the following areas of biotechnological advancement: the discovery of the double helix structure of DNA, in vitro fertilization technology (IVF), the Human Genome Project, and cloning technology.

The first bio-technologic advancement in post-WWII genetic science redefined scientific understanding of how life is regulated and determined. Watson and Crick’s discovery of the double helix structure of DNA uncovered the mechanisms of DNA replication, gene expression, protein synthesis, and other biological information (Hatfield 2). Watson and Crick’s project was part of the postwar effort to understand the role of

genetics, and genetic damage, in human life. After the nuclear attacks on Japan, scientists wanted to determine the long-term impacts of high levels of nuclear radiation because the Japanese had been exposed to radiation levels far greater and on a much greater scale than previously seen (Cooke-Deegan 93). Additionally, the onset of the Cold War brought with it the threat of a nuclear attack. Radiation from such an attack was a public health threat, and researchers hoped that, through understanding DNA, they could understand the dangers of nuclear war (Cooke-Deegan).

While genetics and biology provided one explanation for how life is regulated, theorists continued to investigate the social forces that regulate human life. Michel Foucault attempts to define the mechanisms that regulate life as the “biopolitics of the population” (Foucault 142). He tells us that the expansion of universities, schools, workshops, and other institutions constituted an expansion of techniques applied to achieve the “subjugation of bodies and control of populations” (Foucault 140). He suggests that “biopower” can be used to “designate what brought life and its mechanisms into the realm of explicit calculations and made knowledge-power an agent of transformation of human life” (Foucault 143). According to Foucault, the mechanisms of power have shifted over time and assumed new forms.

Control over life becomes increasingly about the biological as a means of control and regulation. Biodeterminism and psychoanalysis, popular in the United States in the 1940s and 1950s, provided models of human behavior. Biodeterminism suggests that all human behavior is regulated by genetic code. Psychoanalysis, in contrast, is a set of psychological theories which offers what some say is a contradictory model of human behavior: the human is biodetermined and yet undetermined (Bruhm). In psychoanalytic

theory, for example, environment may cause children to behave in certain ways, but children may also be predisposed to certain behaviors.

The second moment of biotechnological development occurred in the 1970s. Researchers were working to create technology that mimicked the processes of sexual reproduction. This research led to the creation of in vitro fertilization (IVF) technology (Kamel). IVF redefined the relationship between humans and technology and the relationship between biology and technology. While over five million children have been born through IVF, the birth of Louise Brown in 1978—the first child born through IVF—raised concerns over the union of biology and technology (Kamel). Sarah Franklin writes, “That biology has become technology is not a metaphoric description: to make iPS cells, viruses are used to transport the required genes, and the genes, or factors, themselves become tools in the process of forcing a cell to reorganize itself” (Franklin 3). She explains, “In vitro fertilization is at once a technique, a model, an imitation of a biological process, a synthetic process, a scientific research method, an agricultural tool, and a means of human reproduction—of making life” (Franklin 3). She calls IVF “doubly reproductive” because it “reproduces reproduction, and its reproductive success biologically is what confirms, or proves, that it works technologically” (Franklin 6). IVF redefined human relations with technology because scientists began to think of biological processes as technological and of technological processes as more biological.

In the years following its popularization, IVF brought a new set of ethical concerns when coupled with other developing technologies. On June 4, 1991 the *New York Times* published “More Babies Being Born to Be Donors of Tissue.” The article reported on the case of one family, the Ayalas, who intentionally conceived a child to

provide donor tissue for their 19-year old daughter who was dying of leukemia. The family was one of the first to admit to intentionally conceiving a child for this purpose, though there were reports of at least 40 other families who discussed the concept with doctors (Kolata). The Ayalas were hardly alone, and with technological advancement, increased testing capabilities, and IVF, the creation of donor siblings became more sophisticated. In 2004, over ten years later, the *Sault Star* published a report on a Chicago laboratory that, through special screening technology while the babies were still embryos, ensured that children conceived to be tissue donors would be suitable donors for their ailing siblings (Tanner).

While IVF changed the relationship between humans and biology, the Human Genome Project of the 1990s changed the relationships between humans, biology, and information. The Human Genome Project gathered biological information and represented it in code form, but to accomplish this goal, computer technology had to be developed to support the massive informational demands of the project (Hatfield 3). The years leading up to and during the Human Genome Project were characterized by both the expansion of computer technology and the expansion of genetic information. Thus, the Human Genome Project redefined how humans handled information while simultaneously redefining the relationship between biology and information.

The new technology also shifted the relationship between information, humans, and biology. With new technological capabilities, scientists were able to track genetic traits and disease over generations and to understand human heredity. The International Human Genome Sequencing Consortium published a draft of the human genome in 2001 (Human Genome), and represented a “basic set of instructions” for the development and

function of a human. While the double helix structure allowed scientists to represent DNA in three dimensions and understand the function of the molecule, the Human Genome Project allowed humans to represent the composition of each gene—the chemical bases, or basic pieces of human life, in code form.

The cloning technology that enabled the birth of Dolly the sheep in the mid-1990s had many scientific, ethical, and moral implications. Sarah Franklin writes of Dolly's birth as the first "virgin birth" and identifies the numerous ways Dolly transformed human thinking on reproduction and sex (Dolly 5). In the period before Dolly, scientists were primarily interested in the coding of genes and paid less attention to the cellular unit. After Dolly's birth, however, the focus shifted back to the cellular unit (Dolly 33). The focus of bioengineering became how cells could be manipulated to function (Dolly 33). Dolly was a product of this shift in thinking.

Human cloning also created new scientific structures for the regulation and redefinition of life. In the United States in the early 2000s, the potential for cloning to provide embryonic stem cells for research was a major issue (President's). Some Americans were concerned with the instrumentalization and abuse of human life that might occur through cloning technology (President's 2). Cloning at this time, according to some, had the power to redefine human life and the role of human life in scientific research by creating a sub-category of human life that carried less ethical weight than the lives of humans conceived naturally or for non-research purposes. That is, the instrumentalization of human life created specifically for invasive research procedures theoretically carried an alternative set of ethical consequences.



Cloning also created new sociocultural structures that redefine life and biological family relationships. Rather than using cloning as part of the methodology of scientific experimentation, cloning to produce children aims to create cloned individuals for more socially oriented purposes. This type of cloning, according to its supporters, could allow for the reproduction of individuals of great genius, talent, or beauty, for infertile couples to have a biological child, for couples to avoid passing genetic disease on to their children, to replicate a loved one, or for rejection-proof transplants of human organs (President's 87). One issue with cloning to produce children is that cloning would create an individual with an uncertain status in the human family. A cloned individual would only have a single biological parent and would fail to have the genetic combination of two parents that characterizes a sexually produced child. Cloning would thus shift the human family into new orientations.

Fictional representations of human cloning, in light of the redefinition of scientific and socio-cultural structures prompted by cloning technology, then become significant in defining the ramifications of reproductive technology. In Chapter One of this project, I analyze how William March's 1954 novel *The Bad Seed* suggests a biodeterminist theory of human behavior that runs counter to the psychoanalytic model popular at that time. I argue that Rhoda Penmark and her mother Christine Penmark represent, as a pair, both the "age of anxiety and violence" (March 29) but also represent an early version of what Kaushik Sunder Rajan defines as biocapital. The novel, in its take on heredity and determinism, redefines the role of environment, responsibility, and the natural while also emphasizing the relationships between bio-technology, reproduction, and capital.

In Chapter Two, I analyze the representation of reproduction and technology in Octavia Butler's 1987 novel *Dawn*. I argue that the figure of the ooloi, the third sex the alien Oankali species capable of genetic engineering, redefines the biological as technological, and the relationship between the Oankali and the humans is representative of the relationship between humans and IVF at the novel's publication. I suggest that Butler uses these figures to define the concerns that these developments might be a new avenue for the perpetuation and reinforcement of inequality and the abuse of human life. They are also representative of the instrumentalization and informationalization of the human body that results from the Human Genome Project, which began shortly after the novel's publication.

In Chapter Three, I analyze Kazuo Ishiguro's employment of human cloning in *Never Let Me Go*. I suggest that the cloned children are symbolic of the main anxieties of cloning as the instrumentalization of human life, the conversion of the body into a subject of consumption, and the creation of a new system of valuation that prioritizes certain human bodies over the bodies of others. Ishiguro's novel depicts an informational system that complicates the valuation of human life and depicts the attempted mechanization of the concept of the human soul in ways that suggest the dehumanization that accompanies the informationalization of the body.

From the work of March to Ishiguro, this project examines the evolution of regulation and responsibility as technoscientific advancement increasingly redefines these concepts. Each work represents an attempt to re-stabilize definitions of the natural, the human, and of responsibility in a system that resists stabilization.

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Anxiety and Violence: The Rise of Genetics and Models of Biodeterminancy in William  
March's *The Bad Seed*

On February 28, 1953, scientists Watson and Crick uncovered the structure of DNA—the double helix. Prior to their discovery, the role and function of DNA was under debate by the scientific community. In the 1930s, the development of microspectrophotometry and staining techniques allowed cytochemists to understand more about the chemistry of chromosomes. Some scientists had already theorized the role of certain parts of a cell in passing hereditary characteristics. Oscar Hertwig proposed in 1885 that the nuclein, material from the nucleus of a cell, was likely responsible for the transmission of hereditary characteristics. Although we now know the significance of nucleic acid, for the early part of the twentieth century, it was thought to be “simple, repetitive, and rather uninteresting chemicals.” In 1952, Hershey and Chase suggested that DNA was, in fact, genetic material. Watson and Crick accepted Hershey and Chase’s discovery while conducting their own research. When the double helix was announced, the shape suggested how the molecules might be copied—a huge advancement towards understanding heredity (History).

William March’s final novel, *The Bad Seed*, appeared in mid-1954, barely a year after Watson and Crick’s discovery. The story centers on Rhoda Penmark, an eight-year-old girl and her mother Christine. As Christine unravels the mysterious death of one of Rhoda’s classmates, she discovers that her daughter is a serial killer. Worse still, Rhoda is a biodetermined killer. Christine’s mother, Rhoda’s grandmother, was a serial killer, and Rhoda has inherited “the bad seed” through Christine. By the end of the novel,

Rhoda has killed at least three people, a puppy, and prompted her mother's suicide.

Rhoda and Christine represent the anxiety and violence that March's novel suggests characterized 1950s America. Rhoda embodies the novel's biodeterminist theory of human behavior that transforms discussions of responsibility and the natural.

Furthermore, Rhoda and Christine come to prefigure Kaushik Rajan's concepts concerning biocapital, a new phase of capitalism based on the life sciences and biotechnology.

Rhoda represents parental fear about loss of control in a biodeterminist system. For parents at the time, environment represented a means of control over their children's behavior. If child behavior is biodetermined, or preprogrammed from birth, external environment and development is irrelevant in forming a child's behavior and parents lose all control. This is exactly the situation Christine finds herself in with Rhoda. Christine attempts to construct an ideal environment for her daughter. Rhoda is neat, clean, capable, and seemingly innocent. When Christine discovers that Rhoda is responsible for the death of her classmate, she "looked back, reviewing the little girl's life from its beginning, in an effort to see how she had gone wrong in training or affection, to find the mistakes she [Christine] had made...but she could find nothing of true importance" (March 80). During a short interaction with Monica Breedlove, Christine thinks, "Rhoda has been given love and security from the beginning. She was never neglected, and she was never spoiled. She was never unjustly treated. Kenneth and I always made it a point to see that she felt important to us, and wanted. I don't understand her mind or her character" (March 81). Christine's inability to understand her daughter is a major point of anxiety because it indicates a loss of control.

In addition to the impact on her immediate family, Rhoda's murder of her classmate Claude Daigle defines the power structure more broadly speaking in a biodeterminist system. After Claude Daigle is murdered, Christine goes to the Daigle's residence to offer the family her support but finds the family disturbing. Claude himself was described as offering his mother a "damp, unresisting hand" before he departed for the picnic on the day he was murdered (March 28). Claude's father has "the same pale, blue-veined forehead, the same outthrust jaw and small, puckered underlip. The hand he offered Christine was cold and damp" (March 52). Claude's father tells Christine, "You are the first to call. We are not people who entertain a great deal, and we have not made many friends" (March 52). The house is even presented as dislikable, having "that depressing look of expensive bad taste...everything was wrong...even the big Oriental rug somehow offended" (March 52-53). One obvious contrast between the Penmarks and the Daigles is that Rhoda is well loved while Claude and his family have few friends. Rhoda is independent, while Claude is weak and reliant on his mother. Biology comes to represent the structures that underscore class and social power. The Daigles represent a family who has financially joined a higher class, but their lower class characteristics (and their respective placement in the social power structure) are something they cannot leave behind. Rhoda's murder of Claude represents one power structure that maintains and perpetuates social hierarchy. Those who are biodetermined like Rhoda will be dominant regardless of external social structures.

Parents in 1950s America feared the results of the breakdown of the traditional family unit. After World War II, many of the men who had served in the military returned home, married quickly, had children, and began family life (Mock 32). Childrearing was a major

subject, and the “baby manual” quickly gained popularity. The work of Benjamin Spock, author of the major bestseller *Baby and Child Care* (1946), placed psychoanalytic theories, the system of psychological theories developed by Sigmund Freud, at the center of his contribution to the field (Knaak). Although the book was popular, some complained that Spock’s work was contradictory and confusing to parents (Bruhm). Spock imagines “a child who is the product of its domestic environment while being at the same time [a] predetermined, already-programmed human being” (Bruhm). Here, critics point to one of the proposed problems with psychoanalysis—it fails to restrict itself to one coherent model of human behavior.

Spock, and one of his contemporaries Fontaine, also “saw the active mediation between violence and tenderness as the family’s core. The notion that marriage and child-rearing were difficult and needed to be worked at...was perhaps the most consistent element of discourse on the American family at the time: happy families were not easy or ‘natural’” (Mock 32). Yet the happy family was considered necessary for the raising of well-behaved children—the family represented the means through which the notion of social values were passed between generations (Bruhm).

The Cold War also brought new scrutiny on parent-child relationships, especially between mothers and children. Spock warned that, “A child who did not receive adequate attention during the crucial early period might grow up ‘maladjusted’ and potentially even criminal” (qtd. in Stephens). One scholar even suggested that overly affectionate mothers could render “children—especially boys—soft and vulnerable to ‘unnatural’ suggestions, whether sexual or political” (qtd. in Stephens). In Spock’s thinking, criminal behavior was the result of familial environment.

Rhoda, by destroying three distinct family units, comes to represent the anxiety about the increasing violence of the era that was thought to be destroying families. The first family unit that Rhoda destroys is that of Claude Daigle, the only child of his parents (March 45). The second family unit that Rhoda destroys is that of Leroy, the handyman. Rhoda kills Leroy by setting him on fire while he is napping in a basement. Although Christine offers to support his wife and three children after his death, Rhoda is responsible for the destruction of these families. The final family that Rhoda destroys is, of course, her own family when she prompts Christine's suicide. Through this role, Rhoda comes to symbolize the forces that people were anxious would destroy the family—violence and determinism. These forces, however, were not the only source of anxiety.

Throughout the Cold War period, anxieties about nuclear annihilation and irradiation caused some Americans to build bomb shelters and practice nuclear attack drills. Nuclear radiation could be directly deadly, but it could also cause genetic damage. Much of the anxiety Americans felt about damage from radiation came from the atomic bombing of Japan at the end of WWII, in particular, the risks of genetic mutation. In *The Gene Wars*, Robert Cook-Deegan writes of the Human Genome Project: "DeLisi's idea for a DOE genome project spun off from an effort to study changes in DNA wrought in the cells of the atomic bomb survivors known in Japanese as the hibakusha ('those affected by the bomb')...The history of the genome project is linked to an attempt to determine if there would be a final, genetic wave of effects from bomb exposure" (Cook-Deegan 93). The deadly and invisible threat of nuclear radiation was one of the motivators behind the expansion of genetic science after the world war.



One reason scientists took interest in the hibakusha was to determine the impact of radiation not just on the individual but also on future generations of people. The survivors were reportedly stigmatized because of a belief that “the hibakusha carried mutations caused by the radiation they experienced” and that they would bear deformed children or pass on genetic diseases to their offspring (Cooke-Deegan 94). Some scientists, such as Alfred Sturtevant in a letter to *Science* warned “that atomic bombs already exploded ‘will ultimately result in the production of numerous defective individuals—if the human species itself survives for many generations” (Cooke-Deegan 94). People were afraid for themselves and future generations as nuclear radiation destabilized the relationship between humans and the natural.

March’s novel draws on the more implicit meanings of the natural through Rhoda Penmark—she is a completely natural character, she was naturally conceived and born, her heredity is linear, and her environment was not especially harsh. Through Rhoda, crime is also naturalized, suggesting that defective human behavior is already present in human biology. Rhoda Penmark then comes to reflect not an invasion of evil into the safety of the domestic sphere—she reflects a concept of evil that has always been present.

March’s novel critiques psychoanalysis through conceptions of the natural and to demonstrate the validity of biodeterminism. The Penmark’s neighbor, Monica Breedlove, is a symbol of psychoanalysis. Her obsession with psychoanalysis is a major component of her life. She notes the “one great event in her life, one which she had not been able to forget. In the middle twenties, her husband, not knowing what else to do with her, acceded to her wish that she go to Vienna and be psychoanalyzed by professor Freud,” (March 36). After the initial session, Monica decided that her case was “beyond his

skill,” and she instead went to seek the aid of Dr. Kettlebaum, Freud’s student (March 36-37). As a result of this experience, Monica Breedlove divorced her husband and moved in with her brother Emory (March 36). Her beliefs are described as follows: “Mrs. Breedlove denied the existence of the meaningless thought; everything said, she maintained, no matter how casually, was related, was tied together, was part of a logical and quite comprehensible pattern if others could find the clues or glimpse the design” (March 7).

Psychoanalysis grounds itself in “the belief that human development and personality are strongly influenced by, if not determined by, early life events” (Boldt). Thus, childhood environment is a central component to psychoanalytic theory. It is difficult to pin down what constitutes a natural child in psychoanalytic theory because the child could be determined by environment but may also be determined by biology itself. Biodeterminism, in contrast, defines the natural as the biological. The biodetermined child is the natural child.

Monica Breedlove is the first character to conceptualize the natural in relation to Rhoda’s behavior. However, Monica Breedlove uses the natural to describe Rhoda as acting in the way that children might act without other pressures. When Rhoda asks to keep both precious stones of a necklace she is being given as a present, Monica Breedlove exclaims, “How wonderful it is to meet such a *natural* little girl” (March 12). She then admits, “when I was given that same locket by my uncle Thomas Lightfoot, I just stood tongue-tied in the parlor and twisted my plaid dress, a quivering little mass of anxiety and frustration” (March 12). Monica Breedlove seems to suggest that, in

retrospect, she wishes she could have expressed the same confidence or *natural ease* as Rhoda in making her wishes known.

The second instance where Monica Breedlove describes Rhoda as natural makes it clear that she has misconstrued the motivations behind Rhoda's behavior, despite arriving at correct conclusions about her behavior. After Claude Daigle, Rhoda's classmate, wins the penmanship medal over Rhoda, Mrs. Breedlove tells Rhoda, "Don't you think it would be a lovely little gesture if you went over and offered your congratulations?" (March 23). When Rhoda pulls away and says "No! No! No!" Monica Breedlove laughs after a moment and says, "Oh, I wish my instincts were as natural as yours, my dear...A child's mind is so wonderfully innocent. So lacking in guile or deceit" (March 24). Monica Breedlove is correct that Rhoda does not try to conceal her feelings, but she misunderstands that Rhoda is incredibly deceitful. The source of this misunderstanding is the psychoanalytic model of human behavior that Monica Breedlove applies to her everyday life.

Monica Breedlove's repeated partial misinterpretation of human behavior is a further critique of psychoanalysis's power as illusory and largely accidental. Psychoanalysis fails to adequately explain any of the character's behaviors. Mrs. Breedlove, after noticing Christine's interest in crime, says:

[T]hat she'd always considered Mrs. Penmark's unwillingness to accept sordid or criminal data as symptomatic. In other words, she regarded it as a positive wish concealed under a negative reaction. It meant, really, that for a time she'd been emotionally unable to examine with a necessary detachment her drives toward hate and destruction; but now,

with her anxieties so plainly abated, she was able to do so at last. On the whole, she was pleased with Christine's sudden preoccupation with crime, with her new, more wholesome attitudes. (March 120)

Monica Breedlove has correctly noted the changes in Christine's behavior. Christine has exhibited an increased interest in crime, but Monica Breedlove has come to the wrong conclusions about these changes. Christine is more anxious than ever—not less—because she is discovering her own personal connection with crime and destruction. She is not more emotionally capable of dealing with her anxieties. The discovery that Rhoda is a serial killer forces Christine to investigate crime. Monica Breedlove has made some correct connections about Christine's interest in crime but ultimately fails to see the truth behind Christine's behavior.

Christine, in contrast, does identify the connection between biology and Rhoda's behavior. Through her relationship with Rhoda, Christine comes to a new understanding of the natural in a biodeterminist context. After discovering Rhoda's crimes, Christine says to Rhoda, "Let's not have any more charm or acting... Let's be natural with each other from now on" (March 161). Here, the natural again suggests innate behavior but lacks the connotations of innocence. This conception of the natural fails because Rhoda is already acting in a way that comes naturally to her. Rhoda replies, "I know what you mean. But I won't do anything to her...Aunt Jessie hasn't got anything I want" (March 161). Here, March's novel reveals Rhoda's determination in her own action, which signals Rhoda's naturalness.

When Christine tries to kill Rhoda and then shoots herself, Christine and Rhoda's relationship redefines family power dynamics in biodeterministic terms. While Christine

never questions her own responsibility for Rhoda's crime, Christine is reluctant to blame Rhoda for the crimes she commits. Christine determines that she, "not Rhoda, was the guilty one, for it was she who had passed on the inheritance from Bessie Denker to the little girl" (March 161). In an attempt to atone for passing the bad seed to Rhoda, Christine gives Rhoda a lethal dose of sleeping pills and then shoots herself. Before killing herself, Christine recites her wishes to her husband: "She is not going to destroy you, as she's destroyed me" (March 201). The only way that Christine can guarantee that Rhoda will not kill again is to kill the child. At the same time, Christine attempts to save her husband from the disgrace of Rhoda's behavior by killing Rhoda before she can be publically recognized as a killer. By killing herself and her daughter, Christine also attempts to put an end to the bad seed of her hereditary line.

Through this final interaction between Rhoda and Christine, these two characters represent an expansion on Foucault's theories of biopower and the regulation of life. Foucault writes, "During the classical period, there was a rapid development of various disciplines—universities, secondary schools, barracks, [and] workshops" (Foucault 140). These disciplines marked "an explosion of numerous and diverse techniques for achieving the subjugation of bodies and the control of populations, marking the beginning of an era of 'biopower'" (Foucault 140). For Christine and Rhoda, death is directly tied to control of behavior. In the biodeterminist model, behavior cannot be shaped by environment, so death is the only way to prevent Rhoda from continuing to kill others. In fact, death is the only mechanism of regulation that has the power to overcome the biological mechanisms theorized in the biodeterministic model.

After *The Bad Seed's* publication, advancements in biotechnology eventually came to redefine the biological in terms of the new human relationships with biology that technology enabled. One of the most significant advancements that came after Watson and Crick's discovery was in 1973 when Herbert Boyer and Stanley Cohen's technoscientific development of recombinant DNA technology gave scientists the ability to "cut and splice" pieces of DNA and engineer new genes (Sunder Rajan 5). This technology held great promise in allowing scientists to create new resources for the treatment of human disease. According to Kaushik Sunder Rajan, recombinant DNA represented a new phase of capitalism, and that biotechnology is inseparable from contemporary capitalism (Sunder Rajan 3). Rajan also suggests that "life sciences, which, consequent to the rapid advances in genomics, are increasingly becoming *information sciences*" (Sunder Rajan 3). This is to say that biology progressively becomes more informational through technological advancement. Expanding on this point, Rajan suggests that, "genomics allows the metaphor of life-as-information to become material reality that can be commodified. In other words, one does not just have to conceive of life as information: one can now represent life in informational terms that can be packaged and turned into a commodity and sold as a database" (Sunder Rajan 16). He writes, "One of the things that genomics fundamentally enables is a particular type of materialization of information, and its decoupling from its material biological source (such as tissue or cell line)" (Sunder Rajan 18).

In *The Bad Seed*, Rhoda Penmark and Christine represent a precursor to the decoupling of genetics from its biological source, the informationalization of biology and the increasing abstraction and valuation of genetics in terms of its control over life.

Christine, by classifying her daughter in two distinct ways, identifies the joining between the individual and the biological. First, she identifies Rhoda as an individual, but second, she identifies Rhoda as a product of her genetic code. This conceptualization of her daughter brings Christine to engage with her daughter on a biopolitical level that forecasts the biocapitalist structures that engage with biology as informational and construct control mechanisms around the abstract.

Rhoda herself comes to prefigure biocapitalism in her unending consumerist quest that is fueled by her biology. Rhoda is characterized by a psychologist as “the most precocious child he’d ever seen; her quality of shrewd, mature calculation was remarkable indeed...But perhaps the thing that was most remarkable about her was her unending acquisitiveness. She was like a charming little animal” (March 35). Rhoda’s murders all contain an element of material gain—Claude was killed for the penmanship medal—and in Rhoda’s earliest murder, her acquisitiveness is particularly clear. Mrs. Post, an old woman and eventual victim, had “a crystal ball filled with transparent fluid, a little ball in which fragments of opals floated, glistened, and changed...” (March 74). Mrs. Post tells Rhoda that the necklace “is going to be yours some day, my love. I’m going to leave it to you in my will when I die...but don’t go and get your hopes high, honey, because I haven’t any idea whatever of dying real soon” (March 75). The old woman is soon dead after falling down several flights of stairs and breaking her neck. Rhoda elected to kill the woman for the crystal—almost immediately after the woman’s death, Rhoda asks for the crystal. Once given the crystal, she carries it around for a time afterwards, but Christine notes that Rhoda, “for a time she would rest against her pillow, her lips pursed, her eyes narrowed in an expression reminiscent of the old woman, and

peer down into the shifting opals, as though she had not only taken the old woman's pendant, but her personality as well" (March 76). In her quest to consume, Rhoda exhibits the consumption vital to the capitalist system.

If biocapitalism constitutes a redefinition as the biological as informational, and Rhoda symbolizes the products of genomic science that informationalized the human body, then Rhoda Penmark prefigures biocapitalism. She gestures towards the capitalist structure that Rajan defines from Marx's theories. Rajan writes that commercial capital, "according to Marx, does not create surplus value in and of itself but does so indirectly by constantly perpetuating the circulation of capital, and by providing it with its own self-perpetuating, self-sustaining logic that does not need to originate from the moment of production of commodity" (Sunder Rajan 9). The capitalist valuation system depends on both the produced commodities and on the prospect of future profit (Sunder Rajan 18). He suggests that biotech and pharmaceutical companies rely on this relationship

[W]here on one hand, there exists the manufacture and sale of therapeutic molecules, but, on the other, there exists an elaborate system of valuation that is essential for the existence of these companies that only indirectly depends on this actual manufacture and sale. The everyday existence of a biotech or a pharmaceutical company, then, involves the coexistence of at least these two simultaneous, distinct, yet mutually constitutive forms of capital, one directly dependent on the production of commodity, the other speculative and only indirectly so. (Sunder Rajan 9)

Rhoda and Christine represent some of the earliest figures that engage with the issues specific to the rise of genomics. As a result they allow us to map how these issues



have changed over time. *The Bad Seed* depicts people with overwhelming concerns about the future, and these concerns are largely projected onto the figure of the child.

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## IVF, Invasion, and the Instrumentalization of Life in Octavia Butler's *Dawn*

The birth of Louise Brown on July 25, 1978, marked the beginning of a new stage of human reproduction. Brown was the first child to be born through in vitro fertilization (IVF), a then experimental procedure intended to help couples conceive children despite infertility (Kamel). Louise Brown was born at the age of 38 weeks and 5 days by caesarean section in the United Kingdom (Kamel). Over five million children have been born through the assistance of IVF technology, and the procedure has become commonplace; however, in the 1970s and 80s, many feared that IVF changed human reproduction in ways that placed the human-ness of the technologically produced children in jeopardy. Others accused scientists of overstepping their boundaries and attempting to “play God.” IVF grew to represent a technological invasion into the structure of the human family.

Octavia Butler's *Xenogenesis* series represents the union of biology and technology in several ways. While writing *Dawn*, Butler was thinking strongly about the Reagan arms race and the proliferation of nuclear weapons (Nanda). As I noted in the previous chapter, nuclear weapons were largely responsible for the increased genetic research and informationalization of human life that took place following WWII. Butler invokes the union of biology and technology against the backdrop of nuclear war to represent how this union might be a new pathway for instrumentalization and dehumanization. Butler uses Lilith, the novel's central character, and Nikanj, an Oankali ooloi with genetic engineering capabilities, to uncover the instrumentalization of human

life enabled by reproductive technology. This relationship also allows Butler to explore how conceptions of life itself are changing with increasingly invasive technologies.

*Dawn* follows the interactions between humans and the Oankali, an alien species that saved the humans from nuclear destruction by taking them aboard their space ship. Butler imagines the Oankali as a community of creatures whose primary engagement with the world around them is through the biological. For example, the Oankali use chemical signals to open and close the various doors of their ship, which is itself a biological organism.

Developments in the 1970s and 1980s were changing scientific engagement with the biological. While IVF allowed scientists to create life, the mapping of the human genome in the 1990s allowed scientists to handle genetic information in a new way. These technologies revolutionized the management and manipulation of human biological information. Physicist George Gamow was one of the first people to suggest that human DNA could be represented in code form (Cook-Deegan 56). He recognized that “Like the order of 0’s and 1s’ in the two-letter digital code in computer software, the order of the chemical subunits of DNA contained the instructions...for their biological function” (Cook-Deegan 56). The core idea behind the Human Genome Project was that a great deal of information could be understood about biology by looking at the DNA base sequence. While, as Cook-Deegan writes, “having the map and sequence information would not impart all knowledge of biology, because most interesting questions are about function rather than structure” (Cook-Deegan 57), the sequence was still important because DNA represents the *lingua franca* of biology.

For the Oankali, DNA represents not only the *lingua franca* of biology, but also the *lingua franca* of society. The Oankali are a symbol of the melding of biology and technology. The rejection of tools is one way Butler characterizes the species as an example of this melding. When Lilith asks about the Oankali's use of tools, she is told, "We do that when we have to. We...don't like it. There's no trade" (Butler 83). This tendency to attempt exchange in every possible way—to inject a piece of themselves into their surroundings—is suggestive of real-world fears about the infective nature of technology in light of its expansion. Furthermore, the translation of the biological into an informational form complicated existing conceptions of bioethics and consent. For example, one new challenge of informationalized biology is the ethical use of biological information, a topic that is central to Butler's construct of the alien intersection of the biological and technological.

The Oankali system of "prints" is one way Butler discusses how the translation of the biological into the technological leads to the instrumentalization of human life and complicates issues of consent. The Oankali operate as biological databanks, storing the genetic information of humans in the form of prints. These prints are a type of "memory" which is something different from the straightforward, and internalized, copy of a genetic sequence. The prints can be used to make new human clones of existing humans. While the prints represent an opportunity for the continuation of the human race, the Oankali make prints of the humans they took from Earth without consent. Lilith, when she discovers that a print has been made of her body, asks if the print can be destroyed. She is told that destroying the prints is impossible (Butler 98). The prints represent the level of control that technology granted scientists in the 1970s and 1980s and forecasts future

levels of control that the Human Genome Project and other research suggested were on the horizon. They also symbolize the uncertain mechanisms of control that surround biological information at this time.

Butler places the use of genetic material in a futuristic setting, but the moral and ethical challenges surrounding the use of genetic material and biological information are not new. The challenges Lilith faces in the novel are strikingly similar to the case of Henrietta Lacks. Henrietta Lacks was an African American woman diagnosed with an aggressive form of cervical cancer. When she went to Johns Hopkins hospital for treatment, her cells were sampled and given to researchers Margaret and George Gey who had been trying to “keep cells alive and reproducing in Petri dishes, but had been unsuccessful until they received a sample of the aggressive cells that were killing Henrietta Lacks.” Lacks’ cells “revolutionized” biology because they would reproduce with enough aggression that they would not die in experimental conditions like other cell lines. They provided new opportunities for research but also, as Wald notes, “created a new life form for which there was no precedent” (Wald in Lee 247). While Lacks’ cells were scientifically significant, they were also significant to the state of bioethics.

The Lacks case attracted attention because the cancer cells were sampled without permission from the patient or the family. Although the cells made a dramatic impact on biomedical science, reportedly allowing researchers to create a new polio vaccine (Wald in Lee 247), Lacks’ family was not aware that the cells had even been taken until the 1970s—nearly twenty years after Henrietta Lacks’ death (Wald in Lee 247). They also did not receive any compensation for the contribution of the cells that, when used in research, lead to the creation of profitable pharmaceutical products (Wald in Lee 247).

Lilith, an African American woman, also has her cancer cells sampled and experimented on without her consent. When Lilith awakes in captivity, she is told that she had cancer, but the cancer has been removed. Her “talent” for cancer meant that she was genetically predisposed to developing cancer, but the Oankali have made genetic modifications she will not develop cancer again. Her cancer cells have also been taken and experimented upon in order to create new biological abilities for the Oankali, such as regeneration and increased longevity (Butler 38-39). Her cancer cells eventually enable a critically wounded Oankali to heal itself.

With Lilith, Butler invokes the same ethical and legal uncertainties of the Lacks’ case to engage with issues of consent in the increasingly informational fields of health and biology. While many point to the systematic racism that lead to the unethical acquisition of Lack’s cells, Wald points out that it is “difficult to pinpoint the exact nature of the violation [in the Lacks case]” (Wald in Lee 247). She writes, “neither Lacks nor her family gave consent for the use of her cells, but the case preceded such protocols” (Wald in Lee 248). In Lilith’s case, it is often unclear if what is being offered by the Oankali is beneficial for both parties, or only for the Oankali. Lilith sometimes gives permission to the Oankali to engineer her body, but it is questionable if this permission is given freely.

The ooloi, an Oankali with genetic engineering capabilities, comes to exemplify the merging of biology and technology and symbolizes the reformation of the family. Like the other Oankali, the ooloi exhibit an attraction to the biological, but the ooloi have the capability to sense and interact with genetic material. By interacting with organisms on a genetic level, the ooloi enhance and change their biology. The Oankali, as a group, depend on the ooloi to manipulate and to design the next generation of the species. They



also act as the control mechanism for Oankali reproduction. Jdahya, one of the Oankali, tells Lilith that the Oankali's reproduction is "much more deliberate [about genetics] than what any mated pair of humans have managed so far" (Butler 39). Instead of leaving the gene mix up to chance, the ooloi interact with the DNA to ensure a "good, viable gene mix" (Butler 39). The ooloi are defined by their ability to facilitate reproduction, which is their ability to act as technology. The ooloi is a technological figure, and the Oankali depend on this use of life as technology to continue their existence.

Butler employs the figure of the ooloi to reflect upon issues surrounding the introduction of technology and the family. The dependency of the Oankali on the ooloi in reproduction makes them a central part of the Oankali family. The Oankali have both male and female, but the ooloi are a genderless third party. The ooloi act as the center of reproduction—the Oankali, "needed a male and female pair to be able to play its part in reproduction, but it neither needed nor wanted two-way contact between the male and female. Oankali males and females never touched each other sexually" (Butler 220). The union of two parties is completed through the ooloi, who have complete control over the reproductive process. If the ooloi represent life as technological, then the ooloi family represents a form of the biological family centered on technology.

While on the Oankali ship, the first human that Lilith meets is Paul Titus. Paul, through his relationship with the ooloi, comes to symbolize the application of reproductive technology without consent. While talking to Lilith, Paul says that the Oankali have used his biological material, and he has fathered over seventy children, but he has "never even seen a woman in all the time [he has] been here [on the ship]" (Butler 93). He explains that the Oankali have a vast number of ways to produce new humans.

He says, “They didn’t have enough of us for what they call a normal trade...They had to make more...they took stuff from men and women who didn’t even know each other and put it together and made babies in women who never knew the mother or the father of their kid” (Butler 92). Willing participation by the humans, or any participation at all, is not required for the Oankali to produce more humans.

While the Oankali saved Lilith’s life after the discovery of cancer, it is of note that the curing of reproductive organ cancer was also an act of preserving Lilith as an instrument of the Oankali’s reproductive scheme. The focus on Lilith’s reproductive system is one way that Butler represents a more general, cultural focus on women’s reproductive systems with the invention of new reproductive technologies. Paul Brodwin writes that the feminist engagement with new reproductive technologies “set the agenda for the critical study of biotechnology” (Brodwin 4). New reproductive technologies have the potential, “under the guise of therapeutic benevolence...[to] medicalize female existence and strengthen the control of female bodies within particular networks of power and value. At the most general level, this process advances the masculine desire to control and create life” (Brodwin 4). In other words, the threat of reproductive technology has the potential to transform women’s bodies into reproductive mechanisms, disempowering and de-humanizing women. Reproductive technologies, in short, generate fear that women’s bodies may become technological instruments.

Lilith’s forced pregnancy makes her a symbol of the instrumentalization of human bodies. While Paul Titus’s anxieties arise from an exterior manipulation of his reproductive abilities, Lilith is the victim of manipulation within her body. Nikanj says, after telling Lilith that it has made her pregnant, “The child will be yours and Joseph’s,

Ajahas' and Dichaan's. And because I mixed it, shaped it, seen that it will be beautiful...it will be mine. It will be my first child, Lilith" (Butler 246). Lilith's child has a mix of five different parents, including the ooloi technician responsible for combining the genetic material, and yet Lilith had no voluntary participation in the creation of the child.

This incident of forced reproduction symbolizes fears about life as technological, the abuse of human bodies, colonization, removal from reproduction, and the misuse of genetic material, and channels them into this single incident of forced reproduction. When Lilith asks why she has been impregnated, she is told that her body was ready to have a child, even if her mental state did not align with this assessment. This response is consistent with the Oankali's ranking of the biological over the mental or the emotional. The Oankali think of life in informational terms, reasoning that "intelligence does enable you to deny the facts you dislike. But your denial doesn't matter. A cancer growing in someone's body will go on growing in spite of denial" (Butler 38). For the Oankali, and potentially in systems that rely heavily on biological information, consent constitutes only what is indicated through biological information. Strikingly, in this system, consent can be supposed even when one party is diseased. One of the parents of Lilith's child is Joseph, a man with whom Lilith was romantically involved with and who died before the conception of the child. This incident then becomes symbolic of a new orientation of the family structure based on the union of biology and technology, and on biological information structures that cannot consciously be controlled.

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## Clones, Biopower and the Consumption of Life in Kazuo Ishiguro's *Never Let Me Go*

On July 5<sup>th</sup> 1996, Dolly the sheep, the first cloned mammal from an adult somatic cell, was born in Edinburgh, Scotland. Her birth was announced to the public in early 1997 and received extensive media coverage. Dolly's birth sparked new debates about the future of reproduction, and many felt uncertain about what human reproduction would become in the future. Additionally, many were concerned with the utilitarian objectives that lead to Dolly's birth. Wilmut and the team of scientists who created Dolly initially set out to create transgenic sheep that could express human proteins in their milk (Franklin). The "manimals" milk would be "used to make pharmaceutical products for rare, untreatable genetic diseases such as cystic fibrosis, and for more common metabolic disorders such as diabetes and hemophilia" (Dolly 36). Animal bodies could be used to provide new remedies for disease and cloning technology could enhance the capabilities that genetic engineering already provided. Cloning technology was a result of research to create animals that could be used as instruments to minimize or cure human disease. Dolly's birth represented a technological feat and a potential catalyst for a new system of healthcare dependent on animal bodies.

Kazuo Ishiguro's 2005 novel *Never Let Me Go* makes only a small leap between the use of animal life as an engine for the improvement of human life, to the use of human life as that engine by imagining a society where cloning has become a central part of the healthcare system. *Never Let Me Go* follows a group of young clones as they progress from childhood to adulthood in an alternative version of Britain in a reality similar to our own. The clones are created to be organ donors for non-clone people, and

they are expected to give up their organs—and eventually their lives—upon reaching adulthood. The story is narrated by Kathy H., a clone who has decided to record her childhood at the school Hailsham as she nears the end of her life as a carer, or caretaker, for the clones in the process of donating their organs. In a few months, Kathy will become a donor. Much of the novel addresses issues of what constitutes a legitimate human with full rights—the clones complicate the definition because they are biologically human, but the society that created them has declared that they do not have the same rights to their bodies as non-cloned people. The clones in the novel symbolize some of the main anxieties about cloning that were expressed in real-world debates about cloning around the novel's publication. The clones also symbolize fears about cloning triggering the instrumentalization of human life, the conversion of the body into a subject of consumption, and the creation of a new scale of valuation of life that prioritizes certain human bodies over others.

In 2001, five years after Dolly's birth, the George W. Bush administration assembled a group of individuals, dubbed The President's Council on Bioethics, to advise the administration on bioethical issues. The first publication of the Council, titled *Human Cloning and Human Dignity*, attempts to address the costs and benefits of human cloning. Chaired by Leon R. Kass, the Council claims to investigate cloning “unblinkered, with our eyes open not only to the benefits of the new biotechnologies but also to their challenges” (President's XXVI). They find that cloning “represents a turning point in human history—the crossing of an important line separating sexual from asexual procreation and the first step towards genetic control over the next generation. Thus it carries with it a number of troubling consequences for children, family, and society”

(President's XXVI). In light of these consequences, the council "holds unanimously that cloning to produce children is unethical, ought not to be attempted, and should be indefinitely banned by federal law, regardless of who performs the act or whether federal funds are involved" (President's XXVI).

Although most agreed that the concerns the Council expressed about cloning were legitimate, the report received criticism for focusing too heavily on the social impact of cloning or how cloning might change family dynamics, be psychologically damaging to children and parents, and create new opportunities for perverse family relations. Gregory E. Pence argued in 2004 that the cloning debate is more of a reflection of the people involved in the debate than an actual debate about the future of humanity (Pence 15). According to Pence, the President's Council's debate about cloning, and their reasons against human cloning, were actually discussions of current social and ethical issues in disguise. When the Council expressed fears about the abuse of children that might happen as a result of cloning technology, they were actually discussing existing anxieties about the abuse of children that were already a possibility. Pence writes that "Cloning shines a light into the normally dark places in human relationships...In other words, heterosexuals don't normally talk honestly in public about their true motives for wanting children, what kind they fantasize about having, and what they've done to their own children to bring about their ideals" (Pence 11). Cloning brings to light socially taboo motivations behind reproduction. Ishiguro's clones may similarly function as a de-mystification device. The epigraph of the novel reads "England, late 1990s" (Ishiguro 1), which indicates that the novel is not a meditation on the future, but a meditation on events that have already occurred and are still relevant.

Foucault writes about the era of “biopower” or an era where “The old power of death that symbolized sovereign power was now carefully supplanted by the administration of bodies and the calculated management of life” (Foucault 140). Power became more strongly connected with the regulation of populations and regulation of human bodies. Foucault suggests that, “bio-power is without question an indispensable element in the development of capitalism” (Foucault 140-141). Capitalism would not have been possible without the “insertion of bodies into the machinery of production and the adjustment of the phenomena of population to economic processes” (Foucault 141). Furthermore, these factors needed to grow to optimize forces, aptitudes, and “life in general,” but not in a way that made these factors difficult to control. He suggests that “If the development of the great instruments of the state, as institutions of power, ensured the maintenance of production relations, the rudiments of anatomo- and bio-politics...operated in the sphere of economic processes, their development, and the forces working to sustain them” (Foucault 141). These institutions, he writes, also “acted as factors of segregation and social hierarchization” (Foucault 141). Foucault’s theory of biopower suggests that new power dynamics of the time shift human bodies into the role of consumer and of production mechanism in an economic system.

While Foucault suggests that families, the army, school, police and a variety of other institutions are sources of regulation of human behavior, Ishiguro’s novel suggests that biology is the new incarnation of these forces of regulation. The clones’ bodies are exemplary figures of a capitalist system where the producers are eventually unable to act as consumers because of the abuse of their labor. The clones are responsible for



maintaining and cultivating the institution that perpetuates the consumption and destruction of their own bodies.

Kathy H., and the carer system she represents, is a symbol of the instrumentalization and mechanization of human life. Kathy begins the story, “My name is Kathy H. I’m thirty-one years old, and I’ve been a carer now for over eleven years...I know my being a carer so long isn’t necessarily because they think I’m fantastic at what I do...but I do know for a fact that they’ve been pleased with my work, and by and large, I have too” (Ishiguro 3). Kathy does not mention who “they” are in this situation, though it can be assumed that she is referring to the people overseeing the organ donation system. Kathy takes pleasure in the fact that her donors “have always tended to do much better than expected...hardly any of them have been classified as ‘agitated’ even before fourth donation” (Ishiguro 3). In fact, Kathy is somewhat special compared to the other carers. She says, “I can understand how you [if you are one of the other carers] might get resentful—about my bedsit, my car, and above all, the way I get to pick and choose who I look after. And I’m a Hailsham student” (Ishiguro 4). Despite her key role in maintaining the system, she ultimately receives little reward for her work beyond the intrinsic.

With Kathy H., Ishiguro’s novel defines the complex and sometimes ambiguous relationship between information and reality. Kathy’s ignorance of the interworking of the system is one sign of the way human life has been instrumentalized in this society. It is less important that Kathy understand why she has been allowed to pick her donors, only that she have some feeling of success without any obvious reward. Kathy has her suspicions about why she has been given the privileges and recognition that she has, but she can never be certain if she has these things because of her work or because of chance.

Kathy is rewarded for complacency in not knowing the reasons behind the things that happen. The carers are instrumentalized because they complete work for the sake of others and receive benefit themselves.

The informational structure of Ishiguro's novel defines how life is informationalized and instrumentalized. When Kathy begins to narrate her childhood experiences at Hailsham she recounts the impact that information had on her young life and on the guardians charged with caring for the clones. Knowing certain information and not knowing other information impacts all of the Hailsham students and the guardians in charge of the school. Miss Lucy, one of the guardians, insists that the children have been "told and not told" (Ishiguro 88) and tries to provide the children with more information about the system in which they live. The children are also suspicious that they have been told more than they were consciously aware—Kathy writes, "when the guardians first started giving us proper lectures about sex, they tended to run them together with talk about the donations... In other words, it's possible the guardians managed to smuggle into our heads a lot of the basic facts about our futures" (Ishiguro 83).

Shortly before the novel's publication came the completion of the Human Genome Project (HGP) in April of 2003. *Never Let Me Go*'s theme of informational power was a popular issue in the early 2000s because of the international significance of the Human Genome Project. The HGP propelled genetic science further into the realm of the informational. Scientists attempted to deconstruct the functioning of the human body and render that function in an informational form. The HGP provided scientists a map of the structure, organization, and function of a complete set of human genes to further

scientific understanding of human life (History). While the HGP did not provide scientists with a complete understanding of human biology and an unrestricted ability to manipulate that biology, the project did provide scientists with a new way to manipulate the information of life.

The informationalization of biology has obviously instrumentalized cloned lives, but the children also represent a means through which non-cloned life is mechanized. Hailsham attempts to humanize the cloned children to the rest of the world, but in the process, non-clones also suffer. Miss Lucy is the most obvious example of the abuse of non-cloned life that takes place at Hailsham. To humanize the clones, the guardians at Hailsham ask the children to produce artwork. Tommy, unlike most of the other “students,” is not considered creative and begins to act out in frustration. Miss Lucy puts an end to Tommy’s tantrums by telling him that it is okay not to be creative and that there is “at least one person who believes you’re a very good student, as good as any she’s ever come across, never mind how creative you are” (Ishiguro 28). Tommy also reports that Miss Lucy said that they “weren’t being taught enough” and “What she was talking about was, you know, about *us*. What’s going to happen to us one day. Donations and all that” (Ishiguro 29).

Miss Lucy struggles to balance her feelings about the children and their futures with the will of the greater society that compels her to treat the children as less than human. It is difficult to say exactly what information Miss Lucy wanted the children to be taught because Kathy and Tommy are unequipped to probe past the mystery that Miss Lucy represents. They express their confusion about her behavior. Tommy says, “Maybe she was meaning something else completely, something else to do with me not being

creative. I don't really understand it" (Ishiguro 29). Tommy is further confused when Miss Lucy takes back her words about his creativity and insists that Tommy *must* be creative and that she was wrong to tell him otherwise (Ishiguro 108).

Miss Lucy's changing of her message to Tommy about his creativity is reflective of her more generalized fluctuation and failure of Hailsham as an integration device. One morning Kathy finds room 22 darkened. She says, "Miss Lucy was there alone near the back. I could see several loose sheets of dark, shiny paper scattered over the table in front of her. She herself was leaning over in concentration, forehead very low, arms up on the surface, scrawling furious lines over a page with a pencil. Underneath the heavy black lines I could see neat blue handwriting" (Ishiguro 91). It is clear that while Hailsham may be successful in providing the clones with a normalized environment, the school fails to be a normal environment for the guardians. When Miss Lucy eventually notices Kathy's presence, she is described as follows: "her face was flushed, but there were no traces of tears. She stared at me and put down her pencil" (Ishiguro 92). Kathy leaves the event "burning with fear and resentment" (Ishiguro 92). She says, "I wished more than anything that I hadn't seen what I'd just seen, though if you asked me to define just what I was so upset about, I wouldn't have been able to explain" (Ishiguro 92). Kathy's sense of unease, coupled with Miss Lucy's unusual behavior, suggests that there are internal issues within the Hailsham administration. With Miss Lucy, Ishiguro's novel gestures towards the incompatibility of the guardian system's guiding principles—the guardians attempt to prove the clones' humanity to argue for better treatment of the clones, but they do not attempt to uproot the underlying forces that made such efforts necessary. Miss Lucy's inability to continue at Hailsham is a signal that it is impossible to allow for the

humanization of people who will ultimately be consumed and destroyed like animals, and her character reveals the negative impacts on non-clones immediately involved with the organ donation system. The instrumentalization of one form of life, in this case cloned life, leads to the instrumentalization of other life.

The guardians are not the only bodies to be instrumentalized at Hailsham. The children's participation in economic activities with their art is reflective of the trade of human life at the crux of their society. If, through art, the children are representing some parts of their internal selves, the exchanges represent the children selling pieces of themselves to their peers. The children at Hailsham participate in "Exchanges" or art sales. Every three months the children are expected to contribute art to an exchange, and for contributing pieces of art to the exchange the children receive tokens. These tokens are used to "purchase" the art of the other students in their year. Kathy explains, "they were our only means, aside from the Sales...of building up a collection of personal possessions...A lot of the time, how you were regarded at Hailsham, how much you were liked and respected, had to do with how good you were at 'creating'" (Ishiguro 16). Aside from the sales, which are opportunities for children to buy items from outside of Hailsham, the exchanges are at the heart of the internal economy of Hailsham. It seems contradictory that the clones who are going to be instrumentalized by a system that does not value individual qualities (beyond the biological) are encouraged to develop an individual and independent identity through art. Through this seeming contradiction, Ishiguro's novel highlights the impossibility of the system that the creators of Hailsham have devised. It is a signal of the overall devaluation of life.

Art becomes a symbol not just of the exchange of pieces of the internal self—it is a symbol of the instrumentalization of all aspects of the self, even beyond the physical. Madame’s gallery marks the shift in responsibility that occurs in response to cloning and points to the reflectivity of the clones on those responsible for their creation. Tommy shares that Miss Emily “let drop” that the “things like pictures, poetry, all that stuff, she said they *revealed what you are like inside*. She said *they revealed your soul*” (Ishiguro 175). Periodically, Madame would take pieces of the children’s art for her supposed “gallery.” The gallery is, as Kathy and her friends discover, a collection of art meant to represent the humanity of the clones and to provide evidence to argue for the improvement of the clones’ living conditions. The clones are responsible for creating art, for being creative, and for providing the art that will allow the guardians to illustrate to others that the cloned children are human. The art, however, rather than becoming a symbol of the clone’s humanity, instead becomes a symbol of the standards of responsibility to which the clones are subject. This standard is responsible for the clone’s integration into the carer and organ donation systems that instrumentalize their bodies.

Beyond its practical purpose, art comes to represent a greater cultural anxiety about the nature of the soul within Ishiguro’s universe. Within the novel, Madame and Miss Emily are eager for the clones to demonstrate that they possess souls through their ability to create art. Miss Emily says, “Why did we take your artwork?...You said an interesting thing earlier, Tommy. When you were discussing this with Marie-Claude. You said it was because your art would reveal what you were like. What you were like inside...Well, you weren’t wrong about that. We took away your art because we thought it would reveal your souls. Or, to put it more finely, we did it to *prove you had souls at*

*all*” (Ishiguro 260). Madame and Miss Emily, in attempting this goal of revealing the clones’ souls, risk revealing an ethical flaw that could potentially disable the healthcare system as a whole—if the clones have souls like non-cloned humans, it would indicate that cloning has not been successful in creating a new form of human life. What is at stake, then, is that as a society these people may have over estimated the significance of cloning technology and as a result they have enabled the abuse of the innocent.

Hailsham’s mission, then, seems to be to become a device that attempts to grant a level of mystery to the human that technology has removed. In this universe where life itself has become little more than the technological manipulation of genetic material, the soul would suggest that the clones, and their creators, are in some way more than their physical bodies. While the complete informationalization of life suggests that all aspects can be interacted with and controlled in some way, the soul, which cannot be thoroughly organized by an informational structure, would complicate the power system that Ishiguro’s imagined world relies on. In fact, it would suggest that each clone, despite being a symbol of a lack of individuality, would have a component that is unique and unlike all others. This individual uniqueness would then remove the element of disposability to the clones since they would no longer be endlessly replicable humans.

Karl Shaddox writes, “The shock for NLMG’s readers comes not from realizing that the clones are human, but that these humans are clones. It is the difference between these respective acknowledgements by which Ishiguro distinguishes his post-genomic agenda from the Victorian inspired program of the guardians” (Shaddox 253). The guardian system expects that the clones are humans because they have the characteristics that signify a soul—empathy, the ability to create art, reason, and the ability to love. Shaddox

proposes that Ishiguro “demonstrates that the individuality of these human clones, whose genomic codes are identical with at least one other human, does not depend on the intrinsic properties of a soul but on each clone’s emotional singularity” (Shaddox 453). Their ability to be recognized through empathy is what enables the clones to be recognized as humans. Mark Jerng sees *Never Let Me Go* as an expansion of “our notions of the human by reflecting on the narrative modes that shape what it means to be human” (Jerng). For Jerng, it is the process, rather than the product, that characterizes the human.

Others have attempted to define human life in terms of a narrative of development. Judith Butler writes that one way humans have attempted to define human life is:

[B]y recourse to an ontology of personhood that relies on an account of biological individuation...the idea of the ‘person’ is defined ontogenetically, by which I mean that the postulated internal development of a certain moral status or capacity of the individual becomes the salient measure by which personhood is gauged...There is no life without the conditions of life that variably sustain life, and those conditions are pervasively social, establishing not the discrete ontology of the person, but rather the interdependency of persons, involving reproducible and sustaining social relations, and relations to the environment and to non-human forms of life, broadly considered. (Butler 19)

Ishiguro’s novel, however, points to the inadequacy of attempts to define life only from the social capacity of the individual. Liani Lochner writes, in response to Butler’s work, that this definition of life in *Never Let Me Go* forms “the basis for the exploitation and subjugation of certain groups framed as not fully human in society...The issue at stake in



biotechnological debates would, therefore, have to be reformulated not as ‘life itself’ but as the conditions that make life possible and under which life is livable” (Lochner in Wong 102). Hailsham thus becomes the point where the clones are allowed to live in conditions where life is livable, yet they are treated as if life is not livable, only possible. This duality is problematic not only for the clones themselves, but also for those responsible for the function of Hailsham and responsible for inviting clones into livable conditions.

The scene where Kathy is caught listening to the song “Never Let Me Go” is representative of the clone and non-clone relationship and the informational relationship that they share. Kathy plays the cassette tape and begins to dance slowly with a pillow. The pillow represents a baby. Kathy says:

I didn’t used to listen properly to the words [of the song]; I just waited for that bit that went: ‘baby, baby, never let me go...’ And what I’d imagine was a woman who’d been told she couldn’t have babies, who’d really, really, wanted them all her life. Then there’s a sort of miracle and she has a baby, and she holds this baby very close to her and walks around singing: ‘Baby, never let me go...’ partly because she’s so happy, but also because she’s so afraid something will happen, that the baby will get ill or be taken away from her. (Ishiguro 70)

Madame catches Kathy, but instead of entering the room, watches from the corridor.

Kathy notices that Madame is crying, though she can’t make anything of it.

Two events in this scene represent the information structure that characterizes the non-clone and clone relationship. The first event is Kathy’s behavior and realization

about Madame. One of the strangest aspects of this incident is that Kathy does not yet know that she and the other children at Hailsham have been sterilized, but she seems to have some recognition of this fact. Again, the structure of information complicates the clones' interactions with their environment. While Kathy listens to the music, her mental process suggests the system that her body has been created to support the continuation of human life. The song comes to represent the power of the society that consumes cloned life to sustain itself, and Kathy orients herself within this power. The tape, and book title, is a symbol of Kathy's life, and this object which contains a representation of human sexuality becomes one of Kathy's most prized possessions. But in this scene, the song—and Kathy's behavior in response to the song—uncovers aspects of Madame's personality Kathy was formerly unaware of. Kathy says, "She just went on standing there, sobbing and sobbing, staring at me through the doorway with that same look in her eyes she always had when she looked at us, like she was seeing something that gave her the creeps. Except this time there was something else, something extra in that look I couldn't fathom" (Ishiguro 72). Kathy is not certain what she has seen, but she knows it is significant.

The second event is contained within Madame's reaction to witnessing Kathy's behavior. Although we can not know for certain, Madame seems to be recognizing a level of humanity in Kathy that she either did not see or refused to see before. Since Kathy is also recognizing a level of humanity in Madame in this moment, this scene is an example of a dangerous exchange of information that may represent the failure of Hailsham to accomplish its goals. More likely, though, is that this incident represents the impossibility of Hailsham's goals and the inevitability of their failure. In raising children in a

normalized school environment where they are able to have some degree of agency in their daily lives, form social connections, and express their creativity, Hailsham offers the children an opportunity to make themselves recognizable as humans, even to people like Madame, who, in some ways, tries to argue that they are not fully human and do not deserve full rights.

According to Ishiguro's novel, cloning installs a new system of valuation in relation to reproductive capabilities, or lack thereof. Ishiguro's system is not dramatically different from the system of valuation revealed by Dolly the sheep. Dolly, and other creatures created through artificial means, "proved" their fitness as organisms through reproduction. One key element of Dolly's fame was that she was a mostly ordinary sheep. Franklin writes that Dolly's ability to produce offspring naturally "helped to confirm her fitness [as a sheep]" (Dolly 4). Ishiguro comments on reproduction as a means of reinforcing hierarchy and how it is directly tied to reproduction by sterilizing his clones. The clones' lives are seemingly devalued because of their inability to reproduce sexually, yet they are valued for their service to bodies that are capable of reproducing sexually. While in a system where cloning is as readily available, it seems that this kind of valuation would be obsolete. However, the difference between those who can reproduce sexually and those who must reproduce asexually—and the supposed differences between people were produced by these methods—becomes even more pronounced. Lives valued more by this system, though capable of sexual reproduction, are not valued solely on these capabilities. Instead, sexual reproduction becomes a symbol of the mainstream culture. Since reproduction has been taken over by instruments, the human body is no longer instrumentalized in this way.

Not only does reproductive classification stratify social relations, reproductive classification is directly tied to economic valuation. The valuation system creates a new class system that mimics current issues of economic status and reflects fears about the use of the bodies of the poor economic classes. Ishiguro's work suggests that cloning reinforces existing class structures and inequalities. This reinforcement is best seen in the incident when Ruth, Kathy, and their friends see a woman that they believe might be Ruth's "possible" or the model that she was cloned from. After they determine that the woman isn't Ruth's possible, Ruth becomes upset. She says, "We all know it. We're modeled from trash. Junkies, prostitutes, winos, tramps. Convicts, maybe, just so long as they aren't psychos. That's what we came from" (Ishiguro 166). Ruth insists that a seemingly wealthy woman in an art gallery wouldn't want to be a clone model because she would lack incentive. Only the desperate would serve as clone models. Even in this system that places cloned lives below non-cloned lives, the poor may still be responsible for supporting the lives of the wealthy through their biological materials.

The incident with Ruth's possible is also symbolic of the new incarnation of fears about the nature of individuality and family relations. As a result of cloning, even biological origins are revalued to formulate each clone's belonging to a clone group or clone family. The identity of the individuals from which the clones were made—individuals who could be considered parents to the cloned children—holds such power because the clones believe that their point of origin has an impact on their individual identities. In Ruth's case, anxieties about belonging to a particular point of origin are magnified by the perceived significance of her genetic identity and the fact that her genetic identity matches that of another human. The concern is with the significance of

genetic identity and how technology has allowed humans to create other humans with identical genetic identities but differing emotional singularities who all belong to a completely new biological family group to which they may or may not be attached.

The biological family lies at the center of these bioethical debates because the biological family represents the essence of human relations. And while the biological family holds its significance in *Never Let Me Go*, Ishiguro does not fail to account for the significance of interpersonal and communal relationships. Ishiguro's clones evidently live in a structure where the wider non-clone community, through the regulation of both the death and the birth of cloned individuals, creates a balance with the cloned community. The cloned population is regulated enough to ensure the clones stay restricted to their designated positions, but large enough and diverse enough to support the biological diversity of the larger non-clone population. The structure of the clone community raises further questions about the economic value of cloning as a process and about the unique individual value of each clone. While Ishiguro's novel provides only a glimpse of the structures, the relationship between community and economy to the individualized instrumentalization of human bodies is worth consideration since it represents an entry point into modern debates about cloning, bioethical issues surrounding medicine, and the sciences.

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## Conclusion

In this project I explored the evolution of the regulation of life and attempts to re-stabilize definitions of the natural, the human, and of responsibility in light of biotechnological advancements. The years between 1940 and 2010 were a period of the biotechnological redefinition of the natural. My research shows that the rapid rate of scientific progress prevents these definitions from solidifying into a recognizable form for any extended period of time. As biology is increasingly informationalized and technological capabilities rapidly expand, the definitions and metaphorical significances of the natural, the human, and life itself evolve to represent new orientations of these concepts.

An analysis of each work's approach to the natural allows greater explication of the continually unstable state of the natural that remains an issue today. Each work challenges the reader to investigate conceptualizations of the human, the natural, and the relationship between biology and technology.

*The Bad Seed*, as a representative of its time, invites contemporary readers to consider how theories of the mind and biology have informed our understandings of human behavior and continue to evolve. The novel is still relevant because its legacy addresses issues of human behavior, configurations of human development, and ethical challenges that are faced by contemporary readers. In addition, *The Bad Seed* sparked the trope of the "evil child" in horror media, and the phrase "bad seed" has become a widely used expression. The evil child in horror films, as Chuck Jackson notes, despite springing from Rhoda Penmark, is particularly intriguing because the bodies of evil children are



animated by a variety of external forces, like possession, rather than internal or biological forces (Jackson 66).

Octavia Butler's *Dawn* continues to be significant in respect to its position in the rise of reproductive and genomic research, but *Dawn* also finds new relevance in light of recent scientific developments. Mitochondrial replacement techniques (MRT) will begin to redefine the natural family structure. MRT, coupled with IVF, spares children from inheriting mitochondrial disease (Torjesen). However, the technology also produces children with three biological parents (Torjesen). *Dawn's* legacy is not only in charting the convergence of biology and technology, but also how the merging of biology and technology affects social interaction on a variety of levels.

*Never Let Me Go* represents the most recent work in this project, and while the work is somewhat dated in relation to the use of cloning, the relevance of the manipulation and control of human life is still relevant. In fact, the manipulation and control over human life is still under much consideration in light of new technologies. For example, new technology, such as clustered, regularly interspaced short palindromic repeats, or CRISPR, is a gene editing technology that has changed our relationship with genetics in the last five years. In the future, bioengineering may place gene editing at its center, rather than cloning. Still, many of the same bioethical concerns about human modification and questions about what constitutes a natural human remain. *Nature* reported in early March 2016 that in 2015 CRISPR technology was used in China to make genetic changes to human embryos (CRISPR).

While my intervention in scholarship on these novels has been focused on these works within the evolution of reproductive and genetic technologies, much research

following the publication *Never Let Me Go* has focused on evolving concepts of materiality itself and may represent an area of expansion for this project. Materiality, similarly to concepts of the human and the natural, resists stabilization and offers a new avenue of inquiry into the significance of the intervention of technology in human life and the continued informationalization of the human body. In further research, the work in Mel Y. Chen's *Animacies* and collections like *Materiality*, edited by Daniel Miller, will represent a valuable continuation on the work I have completed here.

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